

# ECHO ISO 19115 Implementation Strategy

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## 1 Overview

This document outlines a strategy for accommodating incoming ISO 19115 variations and providing a unified ISO 19115 format as well as access to the original metadata.

## 2 Background

ISO 19115 is becoming an increasingly prevalent geospatial metadata standard. The EOS ClearingHouse (ECHO), as a geospatial metadata index currently supports a generic ISO 19115 implementation but with new missions launch supporting their own variations on the standard, ECHO will need to develop a strategy for accepting these new variations but also maintain the ability to provide a consolidated, consistent metadata exports.

Currently, ECHO end-users and clients are able to export metadata in various formats. This is done via file extensions on ECHO API resources. For example, if a user wants to retrieve a metadata collection record in the ISO19115 format, that user can make a request in the following format. Notice the final 9 characters of the request: **‘.iso19115’** designating the request be fulfilled with a specifically formatted file.

[https://api.echo.nasa.gov:443/catalog-rest/echo\\_catalog/datasets/C145052064-ORNL\\_DAAC.iso19115](https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/datasets/C145052064-ORNL_DAAC.iso19115)

To retrieve the data in the “native” format, as it came into ECHO, the user would invoke the following API route. This will not change in the proposed solution

[https://api.echo.nasa.gov:443/catalog-rest/echo\\_catalog/datasets/C145052064-ORNL\\_DAAC](https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/datasets/C145052064-ORNL_DAAC)

The following table summarizes ECHO’s current multi-format support.

Extension	Description	Documentation Links
.xml or none	XML including references to data piece; contains a name, id, and	► <a href="https://api.echo.nasa.gov/catalog-rest/catalog-docs/index.html">https://api.echo.nasa.gov/catalog-rest/catalog-docs/index.html</a> (under complex types, “references”)

	location of a resource.	
.echo10	Full metadata in the ECHO10 format	▶ <a href="https://api.echo.nasa.gov/ingest/">https://api.echo.nasa.gov/ingest/</a>
.iso19115	Limited metadata in ISO 19115 format (proof of concept implementation)	▶ <a href="http://www.isotc211.org/2005/">http://www.isotc211.org/2005/</a>
.atom	Limited metadata in atom FROST format	▶ <a href="http://en.wikipedia.org/wiki/Atom_(standard)">http://en.wikipedia.org/wiki/Atom_(standard)</a> ▶ <a href="http://wiki.esipfed.org/index.php/Federated_Search">http://wiki.esipfed.org/index.php/Federated_Search</a>
.json	Limited metadata in json format	▶ <a href="http://www.json.org/">http://www.json.org/</a>

For more information on the current ECHO REST search and discovery APIs, please refer to the following document: <http://earthdata.nasa.gov/library/echo-rest-search-guide>

NASA has committed to supporting ISO 19115 for all of its forthcoming missions. Over the next several years, a new Stratospheric Aerosol and Gas Experiment (SAGE III-ISS), the Soil Moisture Active Passive (SMAP) mission and Ice, Cloud, and land Elevation Satellite 2 (ICESat-2) will be launched and will all be required to support the ISO 19115 standard. In turn, ECHO will provide metadata indexing for the data produced by these missions.

Unfortunately, each mission seems to be following its own conventions with respect to ISO 19115. Because the standard itself is ever evolving, missions need to be able to work against a specific, concrete schema implementation of 19115 rather than constantly attempting to keep up with the standard. In addition, these missions are finding the need for extending the standard to accommodate data that currently doesn't have a home.

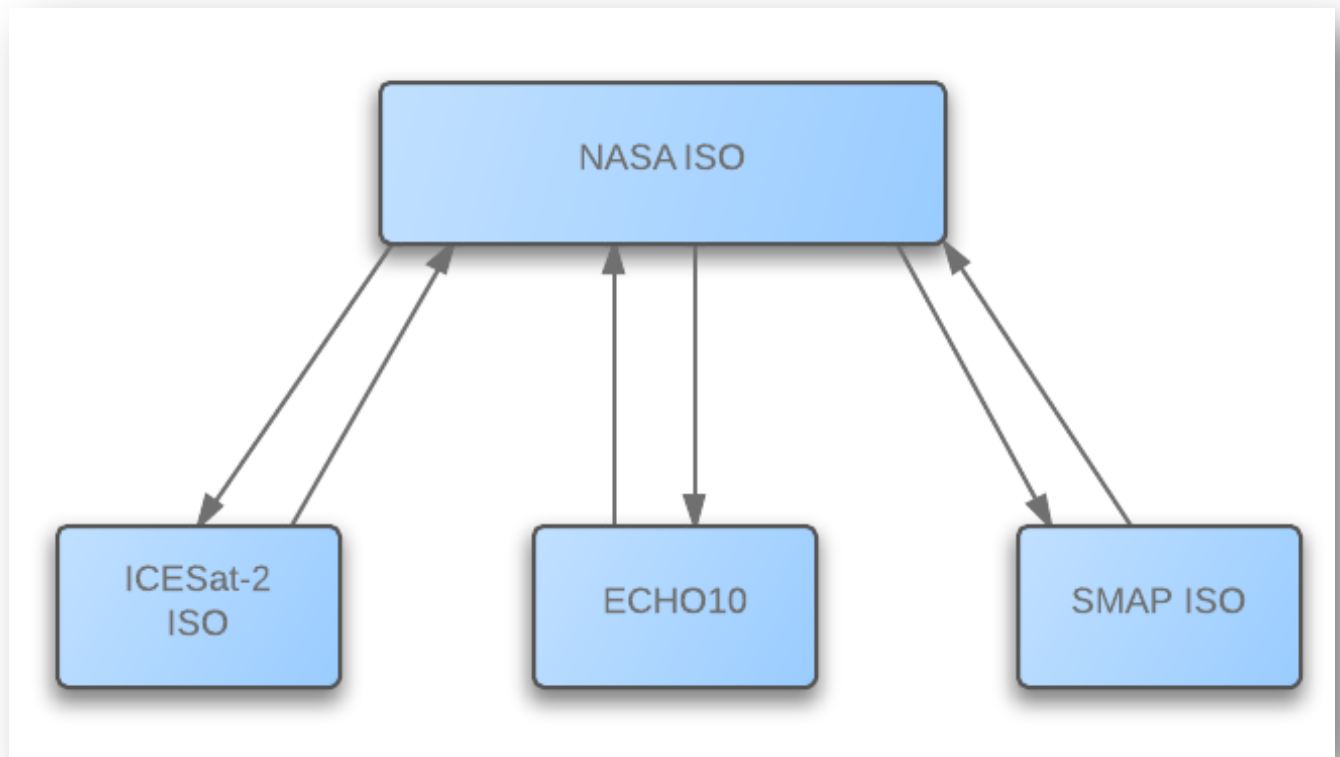
### 3 Proposed Strategy

NASA will attempt to alleviate the problem of multiple ISO conventions being used by the various missions by providing and maintaining a standardized "NASA-flavor" of ISO 19115. ECHO will provide export capabilities to this standard flavor for all of its data. In addition, ECHO will provide translations from the NASA-flavor of ISO to each data format it supports.

ECHO plans to provide ISO support by identifying and maintaining several tenets that will guide its ISO strategy. These tenets will ensure that data is always available to end-users exactly as provided by data partners and also allow for the flexibility of a consistent metadata format for export as needed.

- ECHO will **always** support data retrieval in the native metadata format (no file extension)
- ECHO will support translation of incoming formats to the NASA ISO 19115 flavor via the '.iso19115' file extension.
- More format extensions for data export will be supported and identified as required.

- ESDIS will maintain the XSLTs from various ISO interpretations to the NASA convention. This includes the following list of translations, shown in the diagram below:
  - SMAP ISO to NASA ISO
  - ICESat-2 ISO to NASA ISO
  - ECHO10 to NASA ISO
  - NASA ISO to ECHO10
  - NASA ISO to ICESat-2 ISO
  - NASA ISO to SMAP ISO



These translations are not guaranteed to be lossless. For example, if an ISO record indexed by ECHO contains provenance information, that's not going to be represented in the ECHO10 representation of that record.

The various missions provide data to the data centers for archive; these data are enriched and exported to the ECHO system for search and discovery. When an ECHO end-user requests metadata, whether via ECHO's API or via a front-end such as Reverb, that data can be returned in either the native format, the NASA ISO format, or a translation to any requested format via the NASA ISO translation. The following diagram shows the transition of a record that is indexed by ECHO in the SMAP ISO format and is exported in the ECHO10 format.



Atom, JSON, and csv (at the granule level) will still be supported for all data indexed via ECHO. These data formats are not complex to map and have straightforward concepts that are easy to translate. It should be kept in mind that these formats are not comprehensive; not every XML attribute from an ECHO metadata record will be included in the outputs.

#### 4 Data Partner Impacts

These proposed changes should not impact data partners. These partners should be able to ingest metadata into ECHO using the current mechanisms and formats.

#### 5 End-User and Client Impacts

Reverb users should generally not be impacted by these changes, however the Download service will provide an updated list of optional formats and should notify the user of the possibility of a lossy translation.

It is recommended, but not required that client developers that currently rely heavily on the ECHO 10 format will have to re-evaluate that strategy and focus more on the ISO 19115 flavor maintained by NASA. This results in a shorter translation turnaround and fewer translations between formats.

#### 6 Assumptions

- Translations from 'native' metadata formats to NASA's ISO 19115 flavor are quick and can be performed in a reasonable amount of time.
- Translations of the NASA's ISO 19115 flavor can be cached in ECHO's data store to facilitate quick retrieval for previously translated records.
- ESDIS agrees to maintain and host canonical XSLTs for each required translation
- ECHO will refresh its localized copies of ESDIS XSLTs periodically as translations evolve.
- The '.iso19115' extension will only return NASA's ISO 19115 flavor. Native format retrieval must be done without a file extension.

- Any ISO format being introduced for new collections must be approved by ESDIS and an additional translation from that new format to NASA's ISO 19115 flavor must be maintained by ESDIS.

Date	Version	Brief Description
February 2013	1	Initial Draft
April 2013	2	Document Revision to alter approach

**Table 1 Document Revision History**